Rat’s tail grasses
*Sporobolus pyramidalis, S. natalensis, S. jacquemontii and S. fertilis*

Rat’s tail grasses are invasive grasses that can reduce pasture productivity, out-compete desirable pasture grasses and cause significant degradation of natural areas. They are often referred to as weedy *Sporobolus* grasses.

These species were originally introduced and trialled as pasture grasses and for soil conservation and have been unintentionally spread from these initial introductions and other accidental introductions as contaminants in pasture seed, fodder, on vehicles and machinery and in and on livestock. Rats tail grasses have now adapted well to large areas of northern, eastern and southern Australia. They have low palatability when mature, are difficult to control and can quickly dominate a pasture, especially following drought, overgrazing or soil disturbance. They can affect cattle health and productivity reducing weight gain and growth rates and weaning percentages and weights. These grasses are a significant threat to the broader environment given they are well adapted to Australia, difficult to control and form dense almost mono-specific stands where conditions allow.
Four species of introduced Sporobolus grasses are invasive plants in Queensland:

- giant rat’s tail grass (*Sporobolus pyramidalis* and *Sporobolus natans*;)
- American rat’s tail grass (*Sporobolus jacquemontii*)
- giant Parramatta grass (*Sporobolus fertilis*).

**Legal requirements**

Giant, American and giant Parramatta rat’s tail grasses are category 3 restricted invasive plants under the *Biosecurity Act 2014*. A person must not release these invasive plants into the environment, give away or sell as a seed, plant or something infested with its seeds. The Act requires everyone to take all reasonable and practical measures to minimise the biosecurity risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.

At a local level, each local government must have a biosecurity plan that covers invasive plants in its area. This plan may include actions to be taken on certain species. Some of these actions may be required under local laws. Contact your local government for more information.

**Description and distribution**

Rat’s tail grasses are robust, perennial tussock grasses growing up to 2 m high. They are difficult to distinguish from other pasture grasses before maturity. However, their leaves are noticeably tougher than those of any other species.

They can also be difficult to distinguish from native *Sporobolus* grasses; however, the native grasses tend to be shorter and softer and have less dense seed heads than giant rat’s tail grass. The seeds of all species are indistinguishable in pasture seed samples using current identification techniques.

**Giant rat’s tail grass**

Giant rat’s tail grass grows up to 2 m high, with a seed head of up to 45 cm long and 3 cm wide. Seed head shape changes from a ‘rat’s tail’ when young to an elongated pyramid shape at maturity. Unlike Parramatta grass and giant Parramatta grass, giant rat’s tail grass does not develop ‘sooty spike’ on its seed heads.

Distribution: Coastal and sub-coastal areas from Cape York (Queensland) to the Central Coast of New South Wales including the Central Highlands of Queensland.

**American rat’s tail grass**

American rat’s tail grass grows to 50–75 cm tall, with a seed head of up to 25 cm long and 0.5–3 cm wide. Distribution: Coastal and sub-coastal areas from Cape York to South East Queensland.

**Giant Parramatta grass**

Giant Parramatta grass grows to 0.8–1.6 m tall, with a seed head of up to 50 cm long and 1–2 cm wide. The branches of the seed head are pressed against the axis and overlap, although lower ones generally spread at maturity. Distribution: Coastal and sub-coastal areas from Cape York to South Coast of New South Wales.

**Life cycle and adaptation**

Rat’s tail grasses flower and seed in the frost-free period of the year, with the main seeding in summer/autumn.

They are prolific seed producers with seed production of 85,000 seeds per square metre recorded in dense stands of giant rat’s tail grass in a single year. The viability of rat’s tail grass seed is about 90% with a significant proportion of seed remaining viable for up to 10 years.

Rat’s tail grasses are well adapted to a wide range of soils from low to high fertility, acid to alkaline and sandy to heavy clay soils in high and low rainfall locations. This includes the seasonally dry monsoonal tropics, wet and dry tropics, subtropical and temperate regions of Australia. They also tolerate saline soil conditions.

**Methods of spread**

Rat’s tail grasses are spread in the gut and manure, and the coat and hooves of livestock, on the coat of invasive and native animals and in mud, hay, and untested pasture seed. Vehicles and machinery are also important spreaders of seed. Rivers, watercourses and any fast-flowing water can also move significant amounts of seed over long distances particularly where there are low levels of ground cover.

**Control**

**Managing rat’s tail grasses**

The GBO requires a person to take reasonable and practical steps to minimise the risk of spreading rat’s tail grass seed and the establishment of new infestations. This fact sheet provides information to assist with minimizing spread and a summary of options for controlling rat’s tail grasses.

**Prevention and early detection**

Maintain competitive pastures with high levels of ground cover as this reduces the risk of rat’s tail grass establishment. Heavy grazing does not control rat’s tail grasses —research indicates that continuous heavy grazing actually favours its spread.

When moving stock from infested areas into clean areas, spell the stock in yards or a small holding paddock for at least seven days to allow rat’s tail grass seed to pass through the gut of the animal. Similarly, quarantine new stock in yards or small holding paddocks before releasing them into large paddocks to minimize the risk of rats tail grass seed spread and enable early detection and control of any rat’s tail grass plants that establish. Move stock when there is no dew or rain, to decrease the amount of seed sticking to their coats (see Table 1).

Establish weed-free buffer strips along boundary and internal fences where necessary, drainage lines and roadsides to restrict the spread of rat’s tail grasses. When practical, regularly controlling rats tail grasses in riparian zones will reduce the movement of seed by water and limit spread. Always clean machinery thoroughly after working in infested areas. Follow integrated control strategies using herbicides, pasture management practices that maintain high levels of ground cover and property hygiene practices that limit the risk of seed spread.

Consider the attributes of replacement pasture grasses when deciding what to sow. If possible, choose grasses that are:
• well adapted to local environmental conditions and soil types
• stoloniferous or rhizomatous in growth habit
• resistant to heavy grazing
• palatable and productive
• competitive all year (i.e. do not open up in late winter/spring)
• not inclined to decline as soil fertility decreases
• fast to establish.

If a sown pasture species does not contain most of these attributes, it is unlikely to be successful as part of a rat’s tail grass control program.

Some pasture species, while providing strong competition once established, are weak competitors with rat’s tail grasses in their early stages of establishment (e.g. Koronivia grass and Bisset creeping blue grass). These grasses are most successful against rat’s tail when sown with other grasses that are vigorous when young and provide early competition against rat’s tail grasses (e.g. Rhodes grass).

**Biological control**

Biosecurity Queensland is investigating potential biological control agents. To date no agent has been approved for the control of rat’s tail grasses.

**Management strategies**

Always commence control programs in areas of light infestation, and work towards the denser infestations.

If, after considering the management options set out below, you choose to use a herbicide option, ensure you apply all herbicides strictly according to the directions on the label and the directions of any Australian Pesticides and Veterinary Medicines Authority (APVMA) permit. You must read APVMA permit 9792 if you wish to prepare or use products for the control of rat’s tail grasses in situations other than those specified on the product label.

Some herbicides permitted or registered for giant rat’s tail grass control have withholding periods and significant ongoing management requirements in grazing and dairy farming. If you have or may have dairy or beef cattle on your property at any stage in the future, carefully consider these requirements when choosing herbicides for use on your property.

Some details of management options are provided below.

**Scattered plants and light infestations**

Choose one of the following options:

(a) spot spray with glyphosate
(b) spot spray with flupropanate
(c) use glyphosate through a pressurised wick wiper
(d) hand chip, bag and remove stools from the paddock and burn them.

**Dense infestations on arable land**

(a) Cropping option

**First summer (early)**

1. Boom spray with glyphosate as per label or permit directions and burn prior to ploughing.
2. Spot spray or hand chip fence lines, headlands, drainage lines, shelter belts etc. for weedy rat’s tail grasses missed in cultivation. Plant a long-season forage sorghum variety using a recommended pre-emergent herbicide.
3. Spot spray or hand chip any surviving rat’s tail grasses to prevent reseeding.

**Second summer**

1. Boom spray with glyphosate to control new seedlings and crop regrowth prior to cultivation.
2. Follow the same procedures and similar cropping as for the first summer.

**Third summer**

1. Boom spray with glyphosate to control crop regrowth and any rat’s tail grass seedlings.
2. Plant paddocks with improved pastures using minimum tillage techniques to restrict bringing buried seed to the surface. Use a direct drill planter or surface broadcasting and rolling techniques. Plant fast-growing pasture grasses at triple the standard sowing rates to compete with rat’s tail grass seedlings.
3. Fertilise the pasture for fast pasture establishment.
4. Spot spray or hand chip rat’s tail grass seedlings.

(b) Pressurised wick wiper option

To be effective, this option requires three treatments over an 18-month period.

**First treatment (midsummer)**

1. Make sure there is a 30 cm height difference between rat’s tail grasses and other pasture plants by selective grazing of the ‘good’ pasture.
2. Wick wipe rat’s tail grass using glyphosate as per label or permit directions.
3. Graze using increased stocking rates after wick wiping.

**Second treatment (late summer or autumn)**

Wick wipe rat’s tail grass using glyphosate as per label or permit directions.

**Third treatment (next summer)**

Wick wipe rat’s tail grass using glyphosate as per label or permit directions.

**Dense infestations on non-arable land**

Choose one of the following options:

(a) In summer, apply glyphosate through a pressurised wick wiper (if terrain and timber allow).

(b) In summer, boom or blanket spray with glyphosate in split applications as per label or permit directions (see Table 2) and replant the pasture using fast-growing pasture grasses at double the standard sowing rates.

(c) In winter or spring, boom or blanket spray with flupropanate as per label or permit directions.

**Further information**

Further information is available from your local government office, or by contacting Biosecurity Queensland on 13 25 23 or visit biosecurity.qld.gov.au.
### Table 1. Best practices for management for rat's tail grass infestations

<table>
<thead>
<tr>
<th><strong>Dos</strong></th>
<th><strong>Don'ts</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cattle</strong></td>
<td></td>
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<tr>
<td>• Manage the grazing and stocking rate to maintain high levels of ground cover.</td>
<td>• Don’t overgraze, as this will reduce ground cover to a low level which will promote rat’s tail grass seedling emergence and to emerge.</td>
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<tr>
<td>• Where possible muster only in the afternoon when the dew has dried to minimise seed plants and seeds are dry.</td>
<td>• Where possible avoid mustering on wet days or when the soil is muddy.</td>
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<tr>
<td>• Restrict cattle to a small paddock or a laneway free of rat’s tail grasses with sufficient feed for seven days after grazing the rat’s tail grass paddock to minimize seed spread in manure.</td>
<td>• Don’t deliberately overstock paddocks infested with rat’s tail grass as this generally promotes rats tail grass.</td>
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<tr>
<td><strong>Machinery</strong></td>
<td></td>
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<tr>
<td>• Provide a specific hose-down tarmac/area to clean contaminated machinery.</td>
<td>• Don’t slash areas infested with rat’s tail grasses unless slashing is part of an integrated control program.</td>
</tr>
<tr>
<td>• Keep roadways, laneways, stock routes and machinery corridors free of rat’s tail grass to minimise risk of seed movement by machinery/vehicles.</td>
<td>• Don’t knowingly drive vehicles through rat’s tail grass infestations as contaminated vehicles are a major source of seed spread.</td>
</tr>
<tr>
<td>• If necessary in rats tail grass infested areas operate machinery when plant material and soil are dry to minimise seed movement.</td>
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<tr>
<td><strong>General hygiene</strong></td>
<td></td>
</tr>
<tr>
<td>• Enclose specimens for identification in tied bags or closed containers while transporting to prevent seed spread.</td>
<td>• Don’t drive around the farm with a loose suspected rat’s tail grass specimen in the cabin or in the back of a vehicle as this spreads seed.</td>
</tr>
<tr>
<td><strong>Pasture management</strong></td>
<td></td>
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<tr>
<td>• Maintain sown pasture vigour with a maintenance fertiliser program.</td>
<td>• Don’t allow soil fertility run-down as this reduces the competitiveness of sown pasture species and favours rat’s tail grass.</td>
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<tr>
<td>• Use planting methods that minimise soil disturbance when planting legumes into an infested pasture.</td>
<td>• Don’t renovate an infested pasture as soil disturbance will favour rats tail grasses.</td>
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<tr>
<td>• Plant the recommended competitive pasture grasses suitable for your climate and soil type.</td>
<td>• Don’t burn the pastures infested with rat’s tail grasses unless burning is part of an integrated control program such as a wick wiping, pre-cropping pasture management.</td>
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<tr>
<td><strong>Hay and pasture seed</strong></td>
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<tr>
<td>• Determine the origin of hay to ensure there is a minimal risk of contamination with rat’s tail grasses.</td>
<td>• Don’t knowingly purchase hay or seed contaminated with rat’s tail grass.</td>
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<tr>
<td>• Feed hay in a yard, feedlot or small holding paddock so any rats tail grass plants introduced in the hay can be readily detected and controlled.</td>
<td>• Don’t buy seed without knowing its origin.</td>
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<tr>
<td>• Only purchase seed from a reputable seed merchant.</td>
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<tr>
<td><strong>Control strategies</strong></td>
<td></td>
</tr>
<tr>
<td>• Choose the most suitable control strategy based on your situation and the rat’s tail grass population before starting the job.</td>
<td>• Don’t spot spray with glyphosate using a high-pressure gun from the cabin of a vehicle as this results in off target damage increasing the risk of rats tail grass establishment.</td>
</tr>
<tr>
<td>• If dairy or beef cattle will be in the paddock at any time in the future, carefully consider the exclusion and withholding requirements of the herbicides and the long-term implications before commencing treatments.</td>
<td>• Don’t overspray with glyphosate past the point of spray run-off.</td>
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<tr>
<td>• If spot spraying with glyphosate, operate close enough to spray downwards on to the plant to limit off target damage.</td>
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</tr>
<tr>
<td>• Use low-pressure spraying equipment to reduce the risk of off target damage.</td>
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</tbody>
</table>
### Table 2. Herbicides for the control of rat’s tail grasses

<table>
<thead>
<tr>
<th>Situation</th>
<th>Application method</th>
<th>Herbicide¹</th>
<th>Rate</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pasture, grazed woodlands and agricultural situations prior to sowing,</td>
<td>Boom spraying</td>
<td>Glyphosate 360 g/L (e.g. Roundup Biactive, Weedmaster Duo)</td>
<td>6 L/ha</td>
<td></td>
</tr>
<tr>
<td>tree and vine crops, lucerne and agricultural non-crop situations</td>
<td>Boom spraying</td>
<td>Double knockdown split application</td>
<td>3 L/ha + 3 L/ha</td>
<td>Follow up the first treatment with a later knockdown treatment such as</td>
</tr>
<tr>
<td>Wasteland, forest and conservation areas, margins of aquatic areas,</td>
<td>Spot spraying</td>
<td></td>
<td>1 L per 100 L water</td>
<td>herbicide or tillage</td>
</tr>
<tr>
<td>roadsides and easements, rights-of-way, commercial and industrial areas</td>
<td>Double knockdown split application</td>
<td></td>
<td>1 L + 1 L per 100 L water</td>
<td>Follow up the first treatment with a later knockdown treatment such as</td>
</tr>
<tr>
<td>and public service areas</td>
<td>Wick wiping</td>
<td></td>
<td>3.3 L per 10 L water</td>
<td>herbicide or tillage</td>
</tr>
<tr>
<td>Pasture, grazed woodlands, agricultural non-crop situations</td>
<td>Boom spraying</td>
<td>Flupropanate 745 g/L (e.g Tussock, Taskforce)</td>
<td>1.5–2 L/ha</td>
<td>Do not use in channels, drains or watercourses</td>
</tr>
<tr>
<td>Wasteland, forest and conservation areas, roadsides and easements,</td>
<td>Suppression of seedlings in improved</td>
<td></td>
<td>0.5–2 L/ha</td>
<td>Do not reseed treated areas until at least 100 mm of leaching rain has</td>
</tr>
<tr>
<td>rights-of-way, domestic, commercial and industrial areas, turf,</td>
<td>Spot spraying</td>
<td></td>
<td>200 mL per 100 L water</td>
<td>fallen</td>
</tr>
<tr>
<td>playing fields, golf courses, public service areas and areas</td>
<td>Wick wiping</td>
<td></td>
<td>500 mL per 10 L water</td>
<td>Do not spray near desirable susceptible trees</td>
</tr>
<tr>
<td>surrounding agricultural buildings</td>
<td></td>
<td></td>
<td></td>
<td>Do not apply above 3 L/ha to steeply</td>
</tr>
</tbody>
</table>

¹Read APVMA permit PER9792 for rates for products containing glyphosate 450 g/L or glyphosate 540 g/L.

The herbicides in Table 2 are permitted under PER9792 (expires 30 November 2025). You must read the permit if you wish to prepare or use products for the control of rat’s tail grasses in situations other than those specified on the product label. The permit is available on the APVMA website apvma.gov.au

Read the label carefully before use and always use the herbicide in accordance with the directions on the label.
This fact sheet is developed with funding support from the Land Protection Fund.

Fact sheets are available from Department of Agriculture and Fisheries (DAF) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DAF does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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